

PATENT SPECIFICATION

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457,495

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PROVISIONAL SPECIFICATION

Improvements relating to Mechanism for Locking relatively Slidable Members, such as Slidable Seats of Vehicles

I, ARTHUR WILLIAM CHAPMAN, of Spring Vale, 115, Howards Lane, Putney, London, S.W.15, a British Subject, do hereby declare the nature of this invention to be as follows:—

This invention relates generally to relatively slidable members such as the slidable seats for vehicles and the like and particularly to the mechanism which is provided for locating and locking such seats in their adjusted positions.

More specifically, the invention relates to improvements in the mechanism provided for locking slide members having interengaging edges and which, in the case of a slidable seat, consist of seat slide members secured to the underside of the seat and floor slide members secured to the floor of the vehicle. In such arrangements, the slide members are disposed fore and aft of the vehicle, so that the seat can be adjusted to the front or rear upon the floor slide members and located and locked in any desired position by means of a locking member pivotally mounted on the seat slide member and arranged to engage in holes or equivalent formed in the base or in a side wall of the floor slide member. For one such arrangement reference may be made to the Specification of my Patent No. 384,595.

The locking lever is sometimes arranged to pivot horizontally and sometimes vertically, as described in the Specification of my co-pending Application No. 24126/34 (Serial No. 444,752). In the case of this arrangement, it has been found that the user is not always certain which way the lever should be moved in order to release the two slide members and, consequently, there is a danger of the lever becoming strained, by being pulled forcibly in the wrong direction. One object of the present invention, therefore, is to obviate this inconvenience by providing locking mechanism in which the lever actuating the locking mechanism will act to bring about the release of the two slide members whether moved in one direction or in the opposite direction. As regards a lever pivoted for vertical movement, the ability

to unlock the mechanism by pulling upwards is particularly desirable, not only because it is more natural to pull the lever upwards but because where the top of the seat cushion is high above the floor, it is difficult for the occupant of the seat to stoop to push the lever downwards and then to push the seat backwards whilst he is seated.

According to the present invention, the locking mechanism for slidable seats and the like, comprises two levers one of which is pivoted to the slidable member and the other of which is pivoted to the first mentioned lever and forms the actuating lever proper, the two levers being so disposed relatively to a fixed abutment that no matter whether the actuating lever is moved in one direction or in the other it will always act to cause the other lever to pivot in one direction.

The two levers can be arranged to pivot horizontally or vertically and the said second lever can either act as the locking catch proper or it can be used in conjunction with any of the arrangements described in the Specification of my said Application No. 24126/34 (Serial No. 444,752).

When used with slidable seats for vehicles, the said fixed abutment is conveniently formed by the underside of the base of the seat slide member or by a side wall of the latter, according as to whether the two levers are arranged for vertical or horizontal pivotal movement.

The actuating lever proper will protrude beyond the front edge of the seat slide member (by which the other lever is pivotally carried) so as to be within easy reach of the occupant of the seat.

Constructional features of the invention will be referred to hereinafter.

In one constructional form of the invention, the locking mechanism is made in two parts or levers, the rearwardmost of which is pivoted to a bracket secured to the underside of the base of the seat slide member and arranged at a distance from the forward edge of the slide member. The front lever is connected to the rear lever by means of a pivot pin which is fixed in the

rear lever at a distance from its front end, the arrangement being such that part of the front lever is arranged within the box enclosure formed by the two slide members. The innermost end of the rear lever forms the locking member proper and is formed with a downwardly-projecting catch which, under the action of a spring, arranged between the upper surface of the rear lever and the base of the seat slide member, is adapted to engage in any one of a number of slots or equivalent formed in the base of the floor slide member. When the catch on the rear lever is engaged in one or other of the said slots or equivalent, the upper surface of that part of the front lever which is beneath the base of the seat slide member is closely adjacent and parallel to the said base. The front lever projects forwards beyond the front edge of the seat slide member and is turned upwards at its outer end in order to carry an operating knob whereby the said end can be pulled up or pushed down at the will of the occupant of the seat.

In the event of the operating knob being depressed, the rear end of the upper surface of the front lever at the rear of the pivot pin bears against the base of the seat slide member and, consequently, the adjacent end of the rear lever is depressed. The opposite end of the rear lever, therefore, is substantially raised vertically as the lever pivots about the bracket to which it is hinged. Thus, the catch on the rear lever will be disengaged from the particular slot or equivalent in which it has been engaged, so that the seat can be slid forwards or backwards upon and relatively to the floor slide member.

On the other hand, if the occupant of the seat pulls the operating knob upwards, the upper surface of the front lever will bear against the front edge of the base of the seat slide member which thus acts as a fulcrum. The front end of the rear lever will again be depressed and, consequently, the opposite end of that lever will be lifted and the catch disengaged from the slot or equivalent with which it has been engaged.

In a modification, the rear lever is hinged to the seat slide member so as to be movable transversely thereof instead of vertically as in the above example. In this construction, the catch on said lever is adapted to engage in slots or equivalent formed in the side wall of the floor slide member, whilst one edge of the front lever, which is also movable trans-

versely, is adapted to bear against an abutment on or a side wall of the seat slide member. 65

In a further modification, the rear lever is adapted to pivot substantially vertically but in doing so is arranged to slide a locking bolt or the like horizontally. The inner end of the rear lever is formed with an inclined part or cam which, by cooperating with a similar part or cam on a horizontal locking bolt slidably carried by the seat slide member, is adapted to slide the bolt transversely out of engagement with one or other of a number of slots or equivalent formed in the side wall of the floor slide member, the bolt normally being engaged under the action of the spring. The rear lever and the front or actuating lever are pivotally connected as in the preceding constructions. 70 75 80

In another construction, a similarly disposed locking bolt is employed but the pivotally connected front and rear levers are both arranged to move transversely of the seat slide member, whilst in another construction in which the levers move vertically, the inner end of the rear lever is formed with an inclined surface or cam adapted to cooperate with a corresponding surface or cam formed at the adjacent end of a transversely pivotal lever, which is hinged on a horizontal pivot in the seat slide member. A spring tends to retract the inner end of the locking lever from engagement with one or another of a number of holes or equivalent formed in the side wall of the floor slide member under the action of a spring, but the said rear lever or the front lever is loaded by a heavier spring which is adapted to force the locking lever into engagement. 85 90 95 100 105

From the above description it will be clear that the mechanism according to the present invention can be used in conjunction with any of the locking mechanisms described in my co-pending Patent Application No. 24126/34 (Serial No. 444,752) and that in any case the locking member proper will be moved in the unlocking direction, no matter whether the actuating lever is pulled upwards, or moved laterally to one side, or pushed downwards, or moved laterally to the opposite side, as the case may be. 110 115

Dated this 31st day of May, 1935.

For the Applicant,

STANLEY POPPLEWELL &
FRANCIS,

Chartered Patent Agents,
Jessel Chambers, 88-90, Chancery Lane,
London, W.C.2.

COMPLETE SPECIFICATION

Improvements relating to Mechanism for Locking Relatively Slidable Members, such as Slidable Seats of Vehicles

I, ARTHUR WILLIAM CHAPMAN, of Spring Vale, 115, Howards Lane, Putney, London, S.W.15, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates generally to relatively slidable members such, for example, as the slidable seats of vehicles and the like and particularly to the mechanism which is provided for locating and locking such members or seats in their adjusted positions.

More specifically, the invention relates to improvements in the mechanism provided for locking slide members having interengaging edges and which, in the case of a slidable seat, consist of seat slide members secured to the underside of the seat and floor slide members secured to the floor of the vehicle. In such arrangements, the slide members are disposed fore and aft of the vehicle, so that the seat can be adjusted to the front or rear upon the floor slide members and located and locked in any desired position by means of a locking member pivotally mounted on the seat slide member and arranged to engage in holes or equivalent formed in the base or in a side wall of the floor slide member. For one such arrangement reference may be made to the Specification of my Patent No. 384,595.

The locking lever is sometimes arranged to pivot in one direction and sometimes in the opposite direction in order to unlock the two slide members and it has been found that the user is not always certain which way the lever should be moved in order to release the two slide members and, consequently, there is a danger of the lever becoming strained by being pulled forcibly in the wrong direction. One object of the present invention, therefore, is to obviate this inconvenience by providing locking mechanism in which the lever actuating the locking mechanism will act to bring about the release of the two slide members whether moved in one direction or in the opposite direction. As regards a lever pivoted for vertical movement, the ability to unlock the mechanism by pulling upwards is particularly desirable, not only because it is more natural to pull the lever upwards but because where the

top of the seat cushion is high above the floor, it is difficult for the occupant of the seat to stoop to push the lever downwards and then to push the seat backwards whilst he is seated. As will be understood, the actions of pushing downwards and pushing backwards are contrary and not easy to coordinate.

According to the present invention I provide locking mechanism for locking relatively slidable members, comprising two levers one of which is pivoted to one of the slide members and the other of which is pivoted to the first mentioned lever and forms the actuating lever proper, the two levers being so disposed relatively to one or more fixed abutments that no matter whether the actuating lever is moved in one direction or in the opposite direction, it will cooperate with the single abutment or with one of the several abutments and thus act to cause the other lever always to pivot in one direction.

For convenience of construction, it is preferable to attach the first mentioned lever pivotally to that slide member which is adapted to slide relatively to the fixed slide member.

The two levers can be arranged to pivot horizontally or vertically and the said first mentioned lever can either act as the locking catch proper or it can be used in conjunction with any of the arrangements described in the Specification of my said Application No. 444,752.

When used with slidable seats for vehicles, the said fixed abutment is conveniently formed by the underside of the base of the seat slide member or by a side wall of the latter, according as to whether the two levers are arranged for vertical or horizontal pivotal movement.

The actuating lever proper will protrude beyond the front edge of the seat slide member (by which the other lever is pivotally carried) so as to be within easy reach of the occupant of the seat.

Constructional features of the invention will be referred to hereinafter.

Two constructional forms of the invention, applied to sliding seats of motor vehicles, are shown, by way of example, on the accompanying drawing, whereon:—

Fig. 1 is a fragmentary sectional elevation of a seat slide pair, fitted with a two-piece lever locking mechanism, in which the catch is shown engaged in one

of the slots in the floor slide member;
Figs. 2 and 3 are views corresponding to Fig. 1 and show, respectively, how the catch is disengaged whether the outermost lever is pulled upwards or pushed downwards;

Fig. 4 is a fragmentary sectional elevation of a modification in which the locking mechanism comprises three levers, the catch lever being arranged to pivot in a horizontal plane; and

Fig. 5 is an inverted sectional plan view corresponding to Fig. 4, the catch lever engaging in slots formed in the floor slide member.

Referring first to Figs. 1 to 3:—

The locking mechanism is made in two parts or levers 1 and 2, the rearwardmost 1 of which is pivoted at 3 to a bracket 4 secured to the underside of the base of the seat slide member 5 and arranged at a distance from the forward edge 6 of the slide member. The front lever 2 is connected to the rear lever 1 by means of a pivot pin 7 which is fixed in the rear lever at a distance from its front end, the arrangement being such that part of the front lever is arranged within the box enclosure formed by the two slide members 5 and 8. The innermost end of the rear lever forms the locking member proper and is formed with a downwardly-projecting catch 9 which, under the action of a spring 10, arranged between the upper surface of the rear lever and the base of the seat slide member, is adapted to engage in any one of a number of slots or equivalent 11 formed in the base of the floor slide member. When the catch 9 on the rear lever is engaged in one or other of the said slots or equivalent 11, the upper surface of that part of the front lever which is beneath the base of the seat slide member 5 is closely adjacent and parallel to the said base, see Fig. 1. The front lever projects forwards beyond the front edge of the seat slide member and is turned upwards at its outer end in order to carry an operating knob 12 whereby the said end can be pulled up (Fig. 2) or pushed down (Fig. 3) at the will of the occupant of the seat.

In the event of the operating knob 12 being depressed as shown in Fig. 3, the rear end 14 of the upper surface of the front lever 2 at the rear of the pivot pin bears against the base of the seat slide member and, consequently, the adjacent end 15 of the rear lever is depressed. The opposite end 9 of the rear lever 1, therefore, is raised substantially vertically as the lever pivots about the bracket 4 to which it is hinged. Thus, the catch 9 on the rear lever will be disengaged from

the particular slot or equivalent 11 in which it has been engaged, so that the seat can be slid forwards or backwards upon and relatively to the floor slide member 8.

On the other hand, if the occupant of the seat pulls the operating knob 12 upwards, as shown in Fig. 2, the upper surface of the front lever will bear against the front edge 6 of the base of the seat slide member which thus acts as a fulcrum. The front end 15 of the rear lever 1 will again be depressed and, consequently, the opposite end of that lever will be lifted and the catch 9 disengaged from the slot or equivalent 11 with which it has been engaged.

In the modification shown in Figs. 4 and 5, instead of being formed with a locking catch, the rear lever 1, cooperates with a separate catch lever 18, which is pivotally mounted on the underside of the base of the seat slide member by means of a pivot pin 17. The inner end of the lever 1 is formed with an inclined surface 19 which is adjacent to and co-operates with a correspondingly-inclined surface 20 formed on the catch lever 18. The latter is constantly acted upon by a spring 21 which tends constantly to pull the catch 22 of the catch lever into engagement with one or other of a number of slots 23 formed in one of the vertical walls of the floor slide member. Thus, as in the previously described constructions, whether the outer lever 2 is pulled upwardly or pushed downwardly, the inner end of the inner lever 1 is raised substantially vertically. The co-operation of the inclined faces 19 and 20 on the levers 1 and 18 then causes the catch 22 to move out of the slot 23 in a substantially horizontal direction. When the pressure or pull on the lever 2 is released, the spring 21 pulls the three levers back into their original positions, the catch 22 engaging in one of the slots 23 if it happens to be opposite to a slot.

In another modification, the rear lever is hinged to the seat slide member so as to be movable transversely thereof instead of vertically as in the construction shown in Figs. 1 to 3. In this construction, the locking catch on said lever is adapted to engage in slots or equivalent formed in a side wall of the floor slide member, whilst one edge of the front lever, which is also movable transversely, is adapted to bear against the opposite side wall of the seat slide member, or on an abutment on the latter.

In a further modification, applied to a locking arrangement as shown in Fig. 6 of my prior Specification No. 444,752, the rear lever is adapted to pivot substan-

tially vertically but in doing so is arranged to slide a locking bolt or the like horizontally. The inner end of the rear lever is formed with an inclined part or cam which, by cooperating with a similar part or cam on a horizontal locking bolt slidably carried by the seat slide member, is adapted to slide the bolt transversely out of engagement with one or other of a number of slots or equivalent formed in the side wall of the floor slide member, the bolt normally being engaged under the action of the spring. The rear lever and the front or actuating lever are pivotally connected as in the construction shown in Figs. 1 to 3.

In another construction in which the levers move vertically, the inner end of the rear lever 1 is formed with an inclined surface or cam adapted to cooperate with a corresponding surface or cam formed at the adjacent end of a transversely pivotal lever, which is hinged on a longitudinal horizontal pivot in the seat slide member in the manner shown in Figs. 4 and 5 of my said Specification No. 444,752. A spring tends to retract the inner end of the locking lever from engagement with one or another of a number of holes or equivalent formed in the side wall of the floor slide member, but the said rear lever or the front lever is loaded by a heavier spring which is adapted to force the locking lever into engagement.

From the above description it will be clear that the mechanism according to the present invention can be used in conjunction with any of the locking mechanisms described in my co-pending Patent Application No. 444,752 and that in such case the locking member proper will be moved in the unlocking direction, no matter whether the actuating lever is pulled upwards, or moved laterally to one side, or pushed downwards, or moved laterally to the opposite side, as the case may be.

Although the constructional forms of the invention specifically described above and illustrated on the drawings are shown applied to slide members which together form a box enclosure, it will be appreciated that the invention is equally applicable to what are known as "single edge slides" i.e., slides such as are described and claimed, for example, in the specification of my Patent No. 379,902.

It will also be appreciated that the mechanism can comprise an inner lever pivoted to one of the slide members and adapted to actuate a separate locking lever or bolt and an actuating lever pivoted to said inner lever, the inner and actuating lever and said locking lever or bolt all

being arranged to move in a transverse plane and the fixed abutment being formed by a side wall of the slide member on which the inner lever is pivotally mounted.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Mechanism for locking relatively slidable members, comprising two levers, one of which is pivoted to one of the slide members and the other of which is pivoted to the first mentioned lever and forms the actuating lever proper, the two levers being so disposed relatively to one or more fixed abutments that no matter whether the actuating lever is moved in one direction or in the opposite direction, it will cooperate with the single abutment or with one of the several abutments and thus act to cause the other lever always to pivot in one direction.

2. Locking mechanism as claimed in Claim 1, wherein the first mentioned lever is pivotally mounted on that slide member which is adapted to slide relatively to the fixed slide member.

3. Mechanism as claimed in Claim 2 for use in locking the slide members of slidable seats for vehicles, wherein the actuating lever is arranged to cooperate with a fixed abutment formed by the underside of the base of the seat slide member or by a side wall of the latter, according as to whether the two levers are arranged for movement in a vertical or horizontal plane.

4. Mechanism as claimed in Claim 3, comprising an inner lever which is mounted for vertical pivotal movement on the underside of the seat slide member and an outer (or actuating) lever which is pivotally connected at its inner end to the inner lever and is also movable vertically, the inner end of the inner lever being formed as a locking catch adapted to engage in one or other of a number of slots or equivalent formed in spaced relationship in the base of the floor slide member and the construction being such that whether the actuating lever is pulled upwards or pushed downwards parts of its upper surface contact with the underside of the base of the seat slide member, thus causing the locking catch to be lifted in a substantially vertical direction.

5. A modification of the mechanism claimed in Claim 4, wherein the inner and actuating levers are arranged to move in a transverse plane and wherein the locking catch is adapted to engage slots or equivalent formed in spaced

relationship in the floor slide member, the abutment for the actuating lever being formed by a side wall of the seat slide member.

- 5 6. A modification of the mechanism claimed in Claim 4, wherein the inner lever is arranged to actuate a separate locking lever or bolt, which is pivotally or slidably mounted on the seat slide member and is arranged to engage one or
10 other of a number of slots or equivalent formed in the floor slide member, said locking lever or bolt and the inner lever being formed with cooperating inclined
15 parts or cam surfaces whereby movement of the inner and actuating levers in a vertical plane brings about the movement of the locking lever or bolt in a transverse plane.
- 20 7. Mechanism as claimed in Claim 1 comprising an inner lever pivoted to one of the slide members and adapted to actuate a separate locking lever or bolt and an actuating lever pivoted to said
25 inner lever, the inner and actuating lever and said locking lever or bolt all being arranged to move in a transverse plane and the fixed abutment being formed by a side wall of the slide member on which
30 the inner lever is pivotally mounted.

8. A construction of the mechanism

claimed in Claim 6, wherein the inner lever and the actuating lever are arranged to move in a vertical plane and wherein the separate locking lever is arranged for
35 transverse pivotal movement by being hinged to the underside of the seat slide member, said locking lever being acted upon by a spring which tends to retract it from engagement with one or other of
40 a number of slots or equivalent formed in the side wall of the floor slide member and the inner lever or the actuating lever being loaded by a stronger spring adapted to force the locking lever into engage-
45 ment with the slot or equivalent.

9. Locking mechanism for relatively slidable members substantially as described, and locking mechanism for the slide members of slidable seats for
50 vehicles, substantially as described and also substantially as described and illustrated with reference to Figs. 1 to 3 or Figs. 4 and 5 on the accompanying sheet
of drawings. 55

Dated this 29th day of May, 1936.

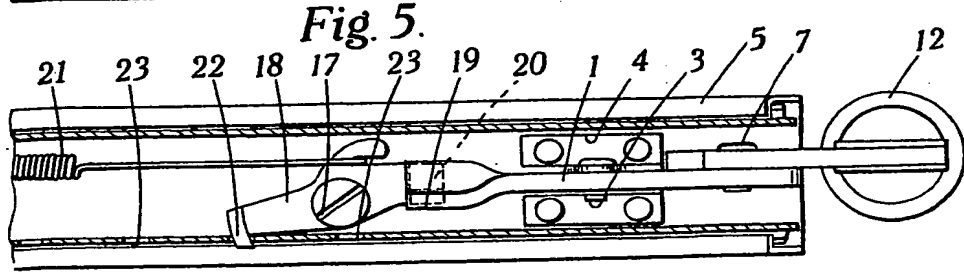
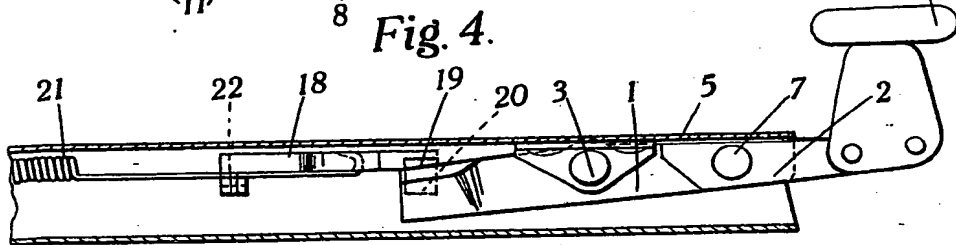
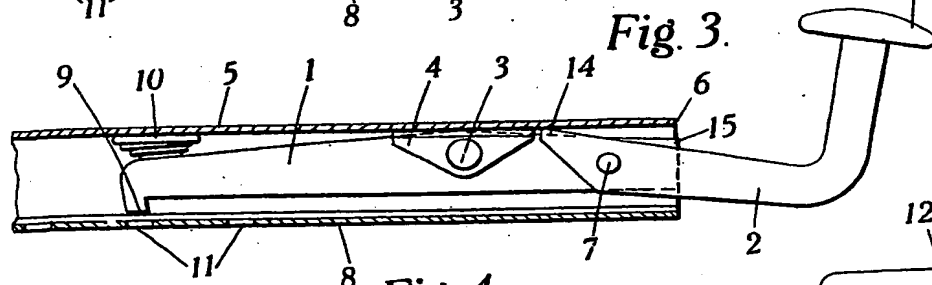
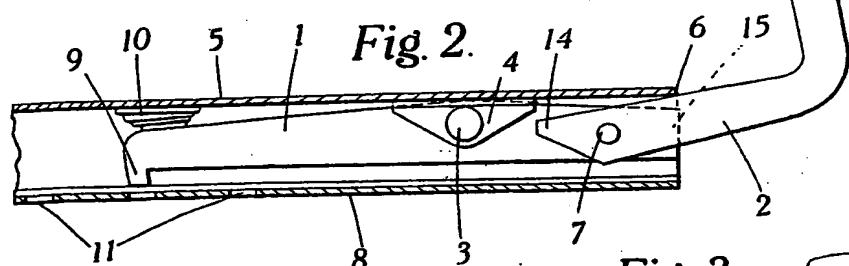
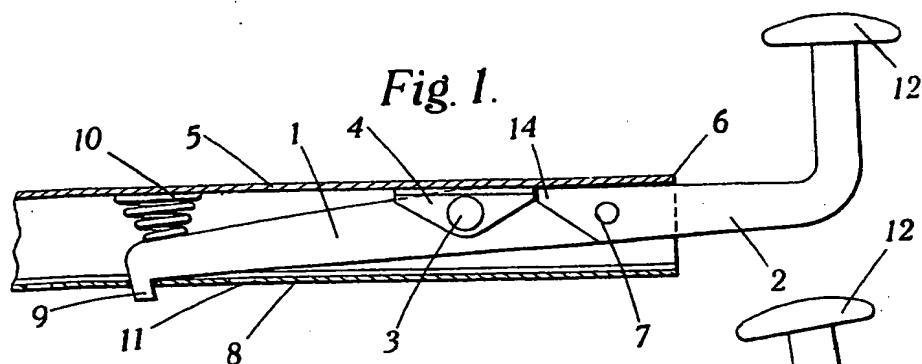
For the Applicant,

STANLEY. POPPLEWELL &
FRANCIS,

Chartered Patent Agents,
Jessel Chambers, 88—90, Chancery Lane,
London, W.C.2.

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